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ABSTRACT

The European program Amerique Latine-Formation Academique (ALFA) has provided 12 Latin-American and 10 European universities and colleges with a framework for creating an International Master in Rural Development. Globalization, regional integration, and sustainability have created a new set of questions for rural areas, both in Europe and in Latin America. The practical problems to integrating master's degrees from 12 different countries have been solved by coming back to fundamental questions: What is an engineer? What is rural development? and How can institutions converge? The result of two years of cooperative work is an international master's degree based on existing curricula. Integrated courses for students, exchange of professors, and research in foreign countries are considered efficient and well-known tools. Two annexes list internal documents discussed in the network and institutions in the network. (SAH)

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ENGINEERS FOR RURAL DEVELOPMENT
Europe and Latin America getting in tune

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ABSTRACT *- The European programme ALFA (Amérique Latine - Formation Académique), has provided 12 Latin-american and 10 European universities or colleges with a frame for creating an International Master in Rural Development (IMDR). Globalization, regional integration (EU, MERCOSUL, NAFTA) and sustainability create a new set of questions for rural areas, both in Europe and Latin America. Though different in the two continents, those problems are now linked and cannot be addressed with old paradigms, nor with « traditional » graduates. International mobility and interdisciplinarity are the main tools used by the ESTRELA network to educate rural development specialists.*

The practical problems to integrate master degrees from 12 different countries have been solved by coming back to fundamental questions.
What is an engineer ? Relations to physical and human environment as educational means, active pluridisciplinarity, lifelong learning are main lines for tomorrow's engineers.

What is rural development ? On the theoretical point of view, European professionals generally insist on agricultural development, when Latin-American colleagues are keener on socio-economical studies. Those fundamental options generate different standards for practise.

How can institutions converge ? On the basis of different concepts and practise for defining an engineer as well as rural development, it has been chosen to try to make existing courses converge instead of creating a new curriculum.

The result of two years of co-operative work is an international master based on existing curricula, in order to integrate innovation in the institutions. Integrated courses for students, exchanges of professors, research in foreign countries are efficient and well-known tools.

Rural development has always been a challenge for agricultural universities or colleges. In an academic world where disciplinary excellence is considered the top ability (and happens to be the one and only way), rural development studies are sometimes considered out of time. As they focus on an object instead of an approach, a method or a discipline, they seem harder to define and even to integrate in the educational organisations. Nevertheless, a network of 22 universities and colleges have been working together for two years, in order to define a new profile for rural development specialists and the way to educate students within this frame. They come from 12 different countries : 5 from Latin America (Brazil, Chile, Cuba, Mexico, Venezuela) and 7 from Europe (Belgium, France, Greece, Italy, Netherlands, Portugal, Spain). The ALFA (Amérique Latine – Formation Académique ; see server www.alfa- program.com) programme of the European Union has given the opportunity to develop prospective thinking. This programme aims at strengthening co-operation between European and Latin American universities, for institutional organisation, graduate and post-graduate studies, research. This paper is a personal view of a complex process, from an active participant. It cannot be considered an « official history » of the network's projects, but a contribution to this history that still has to be written.

In spite of their different traditions, or may be because of them, the institutions in the ESTRELA network had to define first a set of new challenges for rural development. Most of these challenges are common concerns for all academics of our late XX century, though expressed in a specific way through the rural development filter.

⇒ ***Globalization creates a different scale for space and time***. While some dream of Mac Luhan's planetary village, merchants concretely build up a planetary market place. As a science traditionally focused on local questions, rural development is threatened in its deeper roots. Trying to understand reality here (« hic ») in order to act on it now (« nunc ») is the dominant

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paradigm in rural developers' mind. What happens then when « here » is extended from African market place to Chinese temple and « now » is shortened to some seconds (instantaneity of the new information and communication technologies) ?

⇒ ***Rural isn't grandma's farm any longer***. Through globalization, today's farmer is linked to other farmers 5000 km away, through prices, information, environment, political agreements, and depends on them. Anyhow the frame of the globalized society is a network of megacities, radiating on a neighbourhood extended to hundreds of kilometres. In Brazil, society has changed in 60 years from 3 rural / 1 urban to 3 urban / 1 rural. And in France, if rural population is still growing up, it is because people living in suburban cities of less than 2000 inhabitants are considered rural. Rurality must now be studied including its links with urban world.

⇒ ***Sustainability has to become an operational tool***. The concept of sustainability has been given different definitions. Anyway, its global meaning is now intellectually dominated by scholars and by professionals. The "open sustainability", based on social and economical concerns as well as environment is widely accepted. But the tools to implement sustainable programmes are missing. Some macro-indicators are frequently used to evaluate the planet's health : temperature, CO_2 emission, heavy metals pollution. Social or economic indicators, as the human development index, are not so widely approved. And coming to micro or local problems, the lack of indicators is obvious. How can a professional evaluate John's farm sustainability ? And John's town's ? How can he compare it with Abdullah's, Pedro's or Boris' situation ? Operational tools have to be experimented, then discussed and approved by a whole scientific and social community to settle a common language.

⇒ ***Regional integration is at work***. Regional areas, as defined through EU, NAFTA or MERCOSUR treaties, are now the right place to think about rural development. Brazilian production of wheat, as a result of a political will, couldn't resist Argentina's competitive advantages. Wheat producers thus have to find a new activity. In Europe, the most significant budgets for rural development now come from Brussels. Integrating different countries means opening the range of situations that must be taken in account : when compared to the South Italian farmer, the Dutch "developped" farmer looks alike to most of Dutch small farmers. And regional integration also means a way to face globalization : a larger and stronger agriculture can be used either to preserve politically driven policies or to enter international competition with comparative advantages.

⇒ ***Public institutions are seeking a new function***. From the beginning onwards, rural development policies have been based on political will. Environment and landscape preservation, population balance in the territory, or even roots-keeping functions were objectives that fled out of economical order. A new ideology denies any relevance to public action. If this trend creates new spaces for communities being heard and allowed to speak, it mainly aims at transferring legitimacy from the state to the profit organisations. Rural developers have to deal not only with new thoughts but also with new actors who incarnate those options. As they were trained to have a political, long run view, their culture is clearly in conflict with the new ideological gentry.

Those challenges have very concrete effects on agricultural (including related sciences) engineers. In Latin America, agronomists face increasing difficulties to find a job. Most of them were employed as civil servants or managers in big industrialised farms. But public institutions are now disemploying more than employing and « latifundios » are very labour intensive and need few professionals. Even in Europe, there has been some crisis for agronomists' employment. It seemed to the representatives in the ESTRELA network that training students to be rural developers addressing the new identified challenges would open new opportunities for jobs. From our experience, environment, biotechnologies, agriculture related industry were opening new fronts for our students employment. Rural development can be another front, according to the following programme

1. In a globalized world, international mobility gives an added-value to education. In rural development, considered as an action-orientated discipline, comparative approaches and relational creativity are efficient skills. Many funding agencies for rural development are now international. For instance, European Union funding is often submitted to networking institutions from different countries. Professionals must be able to think and to work at international scale. Competition and alliances, opposing or linking territories, is a usual concern in rural development.
2. Students must be trained to integrate a new vision of the "rural", linking it to the global society and the urban world.
3. Development must be rural, and not merely agricultural. Tourism, industry, environment, social activities are key areas, as well as agriculture.

4. The way to train students has to be interdisciplinary. Systemic approaches are a common way to give a scientific support to academic programmes integrating inter-disciplinarity.

On the basis of this wide range programme, 22 institutions had to imagine a new curriculum. And starting to speak about curricular development leads back to practical concerns : duration, finance, degree, administrative management. After some attempts, the ESTRELA network evaluated that general ideas were not sufficient to settle practical action. We had to come back to the point, and think more precisely about 3 questions :

1. What is an engineer ?
2. What is rural development ?
3. How can institutions converge ?

It must be stressed that this way of presenting the process is a re-creation of reality. Those questions have never been formally written on the network's agenda as it is shown here. But, looking back to what has been done, it appears that those points became central in our discussions. In a quite sophisticated latin disorder, we talked each subject over, then left it, then came back to it after some time with new ideas, and discussion with colleagues. This apparently non-rational organisation can be seen afterwards as a powerful help to creativity, avoiding power struggles.

What is an engineer ?

When joining the experience of 12 countries, it appears that practices are quite different. First, the word "engineer". In some cases, an engineer is a technically qualified professional, at an intermediate level in the hierarchy. At the opposite, an engineer can be considered as an executive, able to cover a wide range of functions. In the first meaning, an engineer degree is more or less equivalent to BSc, and the engineer thus seen as an "executive to be". To reach highs levels of responsibility through formal education, he must get a master-mestrado-maestria or doctorate degree. The way from engineer to master, then from master to doctorate is a progressive and consistent one. An engineer is something like a "sub doctor". It can be considered an "intermediary product" since evolution is possible through continuous education. In the second conception an engineer is a "semi-finished good". He is supposed to dominate the basic abilities to become a high level professional very quickly. Those skills are not only technical, but scientific and managerial ones as well. Post graduate studies are thus regarded as one possible way of excellence, different from the engineer job. As an illustration, doctors who were not formerly engineers find in France difficulties to get a job. Regarded on the one hand as an intermediary qualification and on the other hand as a precise product that cannot be compared with others, the word engineer is a source for misunderstanding.

The ESTRELA network had to define what kind of abilities are necessary for the professional to train. In the discussion, the word "master" came as a better platform. Being less culturally-specified than « engineer » it seemed more flexible. The main abilities considered as characteristics were :

⇒ A strong relation to physical and human environment, that can only be achieved through professional-like work "on the ground". Theoretical research cannot be regarded as the best way to train students who will have to be rural developers. Acting on reality, instead of flying over it, is an educational means to understand the world as it is, and not how it should be.

⇒ Active pluridisciplinarity is a condition to try to evaluate a question as a complex system instead of an aggregation of facts. This doesn't mean that a student should know nothing about everything (as the ultra-specialist knows everything about nothing). A student must preferably dominate a scientific area, but must be able, in everyday work, to communicate with colleagues of other complementary areas.

⇒ Life long learning must be initiated as soon as possible. Abilities to develop are a set of skills, not an accumulation of knowledge. The student must be firmly invited to learn by himself, taking advantage of his experience. In this way, international mobility, when carefully prepared, helps creating a shock. As Socrates told, « the first thing to know is that you know nothing ». It is easier to discover in a foreign atmosphere.

What is rural development ?

In Latin America, rural development is most of the time a territory for economics or sociology research. At the same time, human sciences happen to be neglected in the engineering curricula. On the other hand, the European tradition insists on agricultural development. In some cases, for instance in southern countries of Europe, economic and social sciences still stay somehow theoretical. Physical contacts with territories, firms or institutions need to be reinforced. Anyway, most professionals consider that they must take in account human environment, human needs as well as the physical frame. This leads back to the need for interdisciplinarity, need for building up common languages, need for hearing and understanding different approaches. Significantly, only team work can deal with the complexity of complementary approaches. Ability for co-operative work is thus a skill to develop.

Since we are still missing widely accepted indicators to evaluate sustainability, we need to be able to study and compare different approaches in rural development.

Fundamental and practical research must be led to built a coherent set of indicators from the farm's scale up to a country's scale. Setting up a sustainability index for farms would prove unsatisfactory if it cannot be congregated in order to have a macro view of a region. Rural development professionals have to deal with farmers as well as shop owners, with local authorities as well as national power. Their experience is quite important to make the concept of sustainability become a common tool for all actors.

On the practical point of view, each national experience and history generated an original way of handling things. How to deal with a problem is a culturally built attitude, and the actor involved in a concrete world can easily be blinded by reaction that seem "obvious". We must thus insist on "common goods" for all students, whatever disciplinary areas they come from. For instance :

⇒ Structures. What are the actors in the problems to solve ? Were do their legitimacy come from ? For instance public offices and private firms seem different in the eyes of a farmer in Chile or in France. The word community, and obviously the concept it expresses, is quite unusual in the European tradition of rural development. Is it a concept to be imported ?

⇒ Time. Rural development would stay meaningless without projects or programmes. However, the standards for time are quite different between a sociologist trying to understand the cultural roots of migrants and an engineer implementing an irrigation network. Apart from those internal differences, a project manager has to deal with the time of the altiplano peasant as well as with the deadlines of the world bank.

⇒ Relations between actors. Approaching questions in a systemic way means that relations are as important as actors or physical reality. Decipher relations is a key skill for anyone whose function is to act concretely on reality.

How can institutions get in tune ?

First, the network evaluated that convergence between concepts and institutions are necessary. Convergence doesn't mean that every body has to erase everything that doesn't fit in the pattern. It is a long-run concern, in order to promote better understanding between professors, researchers and their institutions. A clearer knowledge of foreign institutions is needed. Many practical hesitations in the progression of the tasks came from an insufficient knowledge of the other universities. It must be stressed that the work was quite easier for the European universities that already worked together in the frame of the ERASMUS programme (http://europa.eu.int/en/comm/d22/socrates/erasinf.html)Students and scholars mobility are efficient tools to understand how a partner university concretely works.

When exchanging on pedagogical concepts, the main temptation is to create something completely new. Building a new curriculum rings pleasantly to the ears of many scholars. We could add that it is quite often easier to build a new house than to reform the old one.

Nevertheless, the network had the ambition to integrate some of its main principles (international mobility, interdisciplinarity, sustainability) into existing curricula.

A curriculum in rural development, as defined by the network, must be able to integrate different profiles of students : technical engineer with work experience, highly specialised professional in sociology as well as in food industry. Our goal became a need to prepare students from different disciplinary areas to take advantage of the "rural development approach". Aware that only few specialists want to brighten their vision instead of going further in their own field, the network must propose very flexible solutions.

The one we have chosen is the following :

⇒ The master curriculum aims at training professionals able to deal with rural development, in a team context. It is not considered as a "pre-PhD" degree.

⇒ The students must be matriculated in an existing master (or equivalent) curriculum of their home university. Within the International Master in Rural Development (IMDR), students simply change or add credits to their regular curriculum. Only some students in the whole group of the regular master in each home university are involved.

⇒ The IMDR gives to its students the opportunity to get the master degree in a different way. They must get at least 20 credits (evaluated according to the European Credit Transfer System, ≡ 4 months, see europa.eu.int/en/comm/dg22/socrates/ects.html) in a foreign country, either for academic credits, research or thesis work. They also must gain 16 interdisciplinarity credits, to enlarge the scope of their abilities. The network has defined 6 areas to evaluate interdisciplinarity : theories of rural development, methodology of research, social and economical sciences, agro-ecology, agriculture and food technology, knowledge and communication.

As a result, the ESTRELA network will now evaluate the quality of its work through the attractiveness of the master. It obviously suffers from some congenital diseases : its identity is somehow complex to understand, international mobility is expensive, colleagues who manage existing masters have to be convinced. Anyway, the job that has been developed for 2 years in an intercontinental context is already operating. The contacts with the first students show

their clear perception of the comparative advantage they get through international mobility, interdisciplinarity and education for sustainability.

But we still need a whole range of tools to better mutual knowledge :

⇒ student mobility makes it possible to identify concretely the differences or misunderstandings (either pedagogical, scientific, administrative or cultural) between institutions ;

⇒ intensive programmes permit open discussion on scientific and pedagogical matters. Some have already been organised with a duration of one week. Other ones are planned for about one month of common research and exchange. They are organised on the continental basis to keep their cost as low as possible (Brazil in 1998, France and maybe Cuba in 1999, Portugal in 2000).

Common research, as an indispensable support to feed teaching, is now the next step for the network. The implementation strategy should progressively take profit of existing actions :

1. first co-led thesis at master level ;
2. then co-led research for doctorate thesis ;
3. and finally common research programmes built collectively.

Annex 1 : Internal Documents discussed in the network

General information

"ESTRELA News", n° 1 to 7 1996-1998 (french, english).

J. BARLOY "Objectifs principaux du programme ALFA du réseau ESTRELA" 1996 (french).

G. MARECHAL "Rapports intermédiaires et rapport final à la Commission des Communautés Européennes du réseau ESTRELA" 1996-1997 (french).

Curriculum proposals

G. GONZALEZ "Maestria internacional de desarollo rural objectivos (proposición colegio)" 1996 (spanish).

R.J. MOREIRA, R. BERBARA, A.L. BARBOSA, S. GOI "Programme de post-graduation en développement rural durable (proposition UFRRJ)" 1996 (english, french, portuguese).

S. BERGAMASCO "Programme de post-graduation en développement rural durable (proposition UNICAMP)" 1996 (french, portuguese).

Generalities on engineer education

V.J. CAVALET, F. ZANETTE "Inovação educativa no ensino superior" 1996 (portuguese).

R.J. MOREIRA "Professional training in agrarian sciences"1996 (english, portuguese).

Generalities on rural development

G. DURAND "Développement rural : contribution au débat" 1995 (french, english).

F. DI IACOVO "Lo sviluppo rurale" 1996 (french, italian, portuguese).

Basic documents on the master's skills areas for interdisciplinarity

J. SILICEO "Creación de un sistema integral de diagnostico" 1996 (spanish).

M. SCARDAMALIA, Carl BEREITER "Computer Support for Knowledge-Building Communities" 1996 (english).

J. WHITE, W. VANDENBOOR "Curriculum as reality : a dynamic tool for active learning" 1997 (english).

P. ALBERTI, E. ZAPATA "Inclusión de la perspectiva de género en la maestria" 1996 (spanish).

R. VERHE "Innovation and technology" 1997 (english).

J.P. ROSSIGNOL "L'espace 1997 " (french).

E. ZAPATA "La perspectiva de género en los programas de mujeres" 1996 (spanish),.

G. MARECHAL "Le développement rural comme construction culturelle" 1996 (french).

S. INTANTE "Los aspectos cuantitutavos en un programa academico en desarollo rural" (spanish), 1996.

Annex 2 : Institutions in the network

EUROPE

Belgium : Université de Gand - Faculté Agronomique et de Sciences Biologiques Appliquées
Spain : Universidad de Cordoba - Escuela Tecnica Superior de Ingenieros Agronomos y de Montes (ETSIAM)
France : Ecole Nationale Supérieure Agronomique de Rennes (ENSAR)
Institut National d'Horticulture (INH) d'Angers
Italy : Universita degli studi di Pisa - Facolta Agraria
Greece : Agricultural University of Athens
Netherlands : Wageningen Agricultural University
Portugal : Universidade do Algarve, Faro
Universidade de Évora
Universidade de Trás-os-Montes e Alto Douro, Vila Real

LATIN AMERICA

Brazil : Universidade Estadual de Londrina
Universidade Estadual de Campinas - Faculdade de Engenharia Agricola
Universidade Federal do Parana, Curitiba
Universidade Federal de Santa Catarina, Florianopolis

Universidade Federal Rural do Rio de Janeiro
Chile : Pontificia Universidad Catolica de Chile - Faculdad de agronomia
Cuba : Instituto Superior de Ciencias Agropecuarias La Habana
Universidad de Holguin
Mexico : Colegio de Post graduados en Ciencias Agricolas, Montecillo
Universidad Autonoma de Zacatecas
Universidad Verecruzana, Xalapa
Venezuela : Universidad Central de Venezuela - Faculdad de Agronomia, Maracay